

**Amendments to the Claims:**

The listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1-5. (Cancelled)

6. (Previously Presented) A catalyst-deterioration diagnostic apparatus for diagnosing a deterioration state of a catalyst used for eliminating noxious substances contained in engine exhaust gas comprising:

an indexer configured to obtain a value of an index which is used for deciding the deterioration state of the catalyst:

a catalyst state estimator operative to estimate a state of said catalyst at a time at which said indexer has obtained the index value, as to a physical quantity which affects a catalytic action of said catalyst;

a correction element operative to correct said index value obtained by said indexer, to a value in a standard state of said catalyst previously set as to the physical quantity, by the use of the estimated result of said catalyst state estimator;

a mechanism operative to suspend a determination of the deterioration state of the catalyst if the value of the standard state value is outside a stored predetermined range ; and

a decision element endowed with a preset criterion value to decide said deterioration state of said catalyst by comparing the index value corrected by said correction element, with the criterion value, wherein;

said catalyst state estimator includes

an operating-situation detected operative to detect a value of that state variable of the engine which correlates with said physical quantity;

a memory operative to store therein correspondence information which indicate correlations between values of the state variable and those of said physical quantity; and

an arithmetic element operative to determine a value of said physical quantity by referring to the correspondence information on the basis of the detected result of said operating-situation detector.

7. (Previously Presented) A catalyst-deterioration diagnostic apparatus for diagnosing a deterioration state of a catalyst which serves to eliminate noxious substances contained in an engine exhaust gas, comprising:

an indexer operative to obtain a value of an index which is used for deciding the deterioration state of the catalyst;

a decision element endowed with a preset criterion value to decide said deterioration state of said catalyst by comparing the index value obtained by said indexer with the criterion value;

a catalyst state estimator operative to estimate a state of said catalyst at a time at which said indexer has obtained said index value, as to a physical quantity which affects a catalytic action of said catalyst; and

a suspension element endowed with a predetermined range concerning the physical quantity to cause said decision element to suspend the decision on condition that a value of said physical quantity obtained by said catalyst state estimator is outside the predetermined range, wherein;

said catalyst state estimator includes:

operating-situation detector operative to detect a value of that state variable of the engine which correlates with said physical quantity;

a memory operative to store therein correspondence information which indicate correlations between values of the state variable and those of said physical quantity; and

an arithmetic mechanism operative to determine a value of said physical quantity by referring to the correspondence information on the basis of the detected result of said operating-situation detector; and

a modifying element operative to modify the index value to a value in the standard state presently set, wherein the arithmetic mechanism compares the modified index value with a present value.

8.-16. (Cancelled)

17. (Previously Presented) A diagnostic apparatus for diagnosing a deterioration state of a catalyst in an engine, comprising:

a memory for storing a preset criterion value and a predetermined range for a state variable of the engine that correlates with a physical quantity affecting a catalytic action of the catalyst; and

a processor operatively connected to the memory for obtaining an index value indicative of a conversion efficiency of the catalyst, receiving a value of the state variable of the engine, suspending a determination of the deterioration state of the catalyst if the value of the state variable is outside the predetermined range, and determining the deterioration state of the catalyst by comparing the index value with the preset criterion value if the value of the state variable is within the predetermined range.

18. (Previously Presented) The diagnostic apparatus of claim 17, wherein the physical quantity is a temperature of the catalyst and the state variable is selected from the group consisting of a quantity of intake air, a quantity of fuel injection, and a revolutions-per-minute of the engine.

19. (Previously Presented) The diagnostic apparatus of claim 17, wherein the preset criterion value represents a limit of deterioration calling for replacement of the catalyst.

20-22. (Cancelled)

23. (Previously Presented) A method of diagnosing a deterioration state of a catalyst in an engine, comprising:

- (a) storing a preset criterion value and a predetermined range for a state variable of the engine that correlates with a physical quantity affecting a catalytic action of the catalyst;
- (b) obtaining an index value indicative of a conversion efficiency of the catalyst;
- (c) detecting a value of the state variable of the engine;
- (d) suspending a determination of the deterioration state of the catalyst if the value of the state variable is outside the predetermined range; and
- (e) determining the deterioration state of the catalyst by comparing the index value with the preset criterion value if the value of the state variable is within the predetermined range.

24. (Previously Presented) The method of claim 23, wherein the physical quantity is a temperature of the catalyst and the state variable is

selected from the group consisting of a quantity of intake air, a quantity of fuel injection, and a revolutions-per-minute of the engine.

25. (Previously Presented) The method of claim 23, wherein the present criterion value represents a limit of deterioration calling for replacement of the catalyst.

26. (Currently Amended) A method of diagnosing a deterioration state of a catalyst in an engine, comprising:

- (a) storing a preset criterion value;
- (b) obtaining an index value indicative of a conversion efficiency of the catalyst;
- (c) detecting a value of a state variable of the engine that correlates with a physical quantity affecting a catalytic action of the catalyst;
- (d) modifying the index value to a value in a standard state of the catalyst previously set as to the physical quantity using the value of the state variable; ~~and~~
- (e) determining the deterioration state of the catalyst by comparing the modified index value with the preset criterion value; and
- (f) suspending a determination of the deterioration state of the catalyst if the value of the state variable is outside the predetermined range.

27. (Previously Presented) The method of claim 26, wherein the physical quantity is a temperature of the catalyst and the state variable is selected from the group consisting of a quantity of intake air, a quantity of fuel injection, and a revolutions per minute of the engine.

28. (Previously Presented) The method of claim 26, wherein the present criterion value represents a limit of deterioration calling for replacement of the catalyst.

29. (Previously Presented) The method of claim 23, wherein steps (d) and (e) are carried out by using a processor which obtains the index value and the state variable from a memory which stores the present criterion value and the predetermined range for the state variable.

30. (Currently Amended) The method of claim 26, wherein steps (d) and (e) are carried out by using a processor which obtains the index value and the state variable from a memory which stores the present criterion value for the state variable.